

CLAIMS

1. A method of manufacturing a preform for producing a plastic optical component comprising a graded-index core portion and a cladding portion in which the refractive index of the core portion continuously decreases from its center to the outer radius, and the refractive index of the cladding portion is smaller than that of the center of the core portion by 0.03 or more, comprising;

a first step of fabricating a polymer hollow tube for the cladding portion in which the inner wall of the polymer hollow tube has an arithmetic mean roughness of less than 0.4 μm ; and

a second step of polymerizing a polymerizable composition in the hollow portion of the hollow tube to thereby form the core portion.

2. The method of manufacturing a preform for producing a plastic optical component of Claim 1, wherein in the first step the hollow tube is fabricated by melt extrusion molding or injection molding.

3. The method of manufacturing a preform for producing a plastic optical component of Claim 1 or 2, wherein the hollow tube is composed of a homopolymer or copolymer of a fluorine-containing monomer.

4. The method of manufacturing a preform for producing a plastic optical component of any one of Claims 1 to 3, further comprising, before charging the polymerizable composition to the

hollow tube, a step of forming an outer core layer on the inner wall of the hollow tube, in which the outer core layer is composed of a polymer having the same composition as the matrix of the core portion.

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5. The method of manufacturing a preform for producing a plastic optical component of any one of Claims 1 to 4, wherein the hollow tube is composed of a fluorine-containing resin obtained by polymerizing a polymerizable monomer composition
10 containing 10% by mass or more of vinylidene fluoride.

6. The method of manufacturing a preform for producing a plastic optical component of any one of Claims 1 to 5, wherein the core portion has a matrix composed of an acrylic resin having
15 an alicyclic hydrocarbon group as a side chain.

7. A preform for producing a plastic optical component obtained by the method of manufacturing a preform for producing a plastic optical component of any one of Claims 1 to 6.
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8. A method of manufacturing a plastic optical fiber comprising a step of stretching the preform of for producing a plastic optical component of Claim 7 under heating 400 to 20,000 times.
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9. A plastic optical fiber obtained by the method of manufacturing a plastic optical fiber of Claim 8.

10. A polymer hollow tube for an optical component having an inner wall with an arithmetic mean roughness of less than 0.4 mm.

5 11. An apparatus for fabricating a polymer hollow tube for an optical component, comprising a manufacturing line for melt extrusion molding.